WHAT IS CLAIMED IS:

1. A method for reforming the surface of polymer membrane including a step of irradiating energized ion particles on the surface of polymer membrane under vacuum condition.

2. A method in accordance with claim 1, wherein the surface reforming is made on two sides or one side of the membrane.

3. A method in accordance with claim 1, wherein the ionic particles are one or more of types of particles selected from a group comprising electron, hydrogen, oxygen, nitrogen, helium, fluorine, neon, argon, krypton, air, and N_2O.

4. A method in accordance with claim 1, wherein the energy of the ionic particles is from 10^{-2} to 10^{7} kilo electron Volts (keV).

5. A method in accordance with claim 1, wherein the dose of the ionic particles is from 10^{3} to 10^{20} ions/㎠.

6. A method for reforming the surface of polymer membrane in accordance with claim 1, wherein the material of the polymer membrane is selected from a polyolefin group comprising polypropylene, high density polyeyhlene (HDPE), low density polyethylene (LDPE), and linear low density polyethylene (LLDPE).

7. A method for reforming the surface of polymer membrane in accordance with claim 1, wherein the material of polymer membrane is one or more polyolefin blend or polyolefin laminates selected from a polyolefin group comprising polypropylene, high density polyeyhlene (HDPE), low density polyethylene (LDPE), and linear low density polyethylene (LLDPE).

8. A method in accordance with claim 1, wherein the polymer membrane is a microporous film manufactured either by a dry process where pores are formed by low and high temperature stretching or by a wet process where material of low molecular weight is extracted to form pores.

9. A separator for a lithium ion secondary battery or alkali secondary battery using polymer membrane of which the surface is reformed by a method of claim 1.

10. A method for reforming the surface of polymer including a step of

irradiating energized ion particles on polymer surface under vacuum condition.

11. A method in accordance with claim 10, wherein the surface reforming is made on two sides or one side of polymer film.

12. A method in accordance with claim 10, wherein the ionic particles are one or more particles selected from a group comprising electron, hydrogen, oxygen, nitrogen, helium, fluorine, neon, argon, krypton, air, and N_2O.

13. A method in accordance with claim 10, wherein the energy of ionic particles is from 10^{-2} to 10^{7} keV.

14. A method in accordance with claim 10, wherein the dose of the ionic particles is from 10^{3} to 10^{20} ions/㎠.

15. A method for reforming the surface of polymer membrane includes the steps of:

a) manufacturing a polymer membrane including the surface activated by inserting a polymer membrane into a vacuum chamber and by irradiating energized ionic particles on the surface of polymer membrane under a high vacuum; and

b) manufacturing polymer membrane treated with a reactive gas reacted on the surface of membrane including the activated surface of the above step a) by infusing the reactive gas after the energized ionic particles of the above step a) have been irradiated.

16. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein surface reforming of polymer membrane provides hydrophilicity or increases hydrophobicity to polymer surface by infusing reactive gas.

17. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the reactive gas infusion of step b) is made without interference of the ionic particles.

18. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein ion beam irradiation of the step a) and reactive gas infusion of step b) are sequentially made.

19. A method for reforming the surface of polymer membrane in

accordance with claim 15, wherein energized ionic particles of step a) are irradiated one side or two sides of polymer membrane.

20. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the ionic particles of step a) are one or more particles selected from a group comprising electron, hydrogen, oxygen, helium, nitrogen, oxygen, air, fluorine, neon, argon, krypton, N_2O, and their mixtures.

21. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the dose of irradiation of step a) is from 10^5 to 10^{20} ion/cm^2.

22. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the energy of ionic particles of step a) is from 10^{-2} to 10^7 keV.

23. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the high vacuum of step b) is 10^{-2} to 10^{-8} torr.

24. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the reactive gas of step b) is infused until the pressure of the vacuum chamber reaches the range of 10^{-6} to 10^4 torr.

25. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the infusion rate of the reactive gas of step b) is 0.5 to 1000 ㎖/min.

26. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the reactive gases of step b) are one or gases selected from a group comprising helium, hydrogen, oxygen, nitrogen, air, ammonia, carbon monoxide, carbon dioxide, carbon tetrafluoride, methane, N_2O, and their mixtures.

27. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the material of polymer membrane of step a) is selected from a polyolefin group comprising polypropylene, high density polyeyhlene (HDPE), low density polyethylene (LDPE), and linear low density polyethylene (LLDPE).

28. A method for reforming the surface of polymer membrane in accordance with claim 15, wherein the material of polymer membrane of step a) is one or more polyolefin blends or polyolefin laminates selected from a polyolefin group comprising polypropylene, high density polyeyhlene (HDPE), low density polyethylene (LDPE), and linear low density polyethylene (LLDPE).

29. A separator for a battery using the polymer membrane of which the surface is reformed according to the method of claim 15.

30. A separator for battery in accordance with claim 29, wherein the battery is a lithium ion secondary battery or an alkali secondary battery.

31. A method for reforming the surface of polymer includes the steps of:

a) manufacturing a polymer including the surface activated by inserting a polymer into a vacuum chamber and by irradiating energized ionic particles on the surface of polymer under high vacuum; and

b) manufacturing polymer treated with a reactive gas on the surface of polymer including the activated surface of the above step a) by infusing the reactive gas after the energized ionic particles of the above step a) have been irradiated.